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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/026,637

12/27/2001

Fumio Koyama

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04/07/2005

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EXAMINER

RODRIGUEZ, ARMANDO

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 04/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/026,637

Applicant(s)

KOYAMA ET AL.

Examiner

ARMANDO RODRIGUEZ

Art Unit

2828



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 and 13-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16-23 is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 13-15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2-18-2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on February 18, 2005 has been entered.

### ***Response to Amendment***

Claims 1-10 and 13-23 are pending.

Claims 11,12 and 24-26 have been canceled.

### ***Priority***

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2 and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Kapon et al (EP 1028505).

Regarding claim 1,

Kapon et al illustrates in figure 1 a surface emitting semiconductor laser having a first mirror means (3) [applicant's first reflection layer], a second mirror means (5) [applicant's second reflection layer], an active region (1) [applicant's active layer] formed between the mirror means, a grid layer (4) [applicant's boundary region] and grid openings (6) [applicant's plurality of divided regions]. Paragraph [0012] discloses the contact layer (2) and the grid layer provide varying reflectivity along the lateral dimension of the laser device thereby varying the loss [applicant's optical loss] and also describes providing single mode. Paragraph [0014] discloses the grid layer suppression of modes [applicant's specific oscillation mode].

Regarding claim 2,

Grid layer (4) includes openings (6) [applicant's recess].

Regarding claim 6,

Paragraph [0012] discloses the contact layer (2) and the grid layer provide varying reflectivity along the lateral dimension of the laser device thereby varying the loss [applicant's optical loss] and also describes providing single mode.

Regarding claim 7,

Paragraph [0023] discloses the reflectivity of the areas covered by the grids as having a lower reflectivity than areas not covered by the grids.

Regarding claim 8,

Paragraph [0032] discloses insulation layer (11), which is formed by oxidation [applicant's current confinement] and disposed between mirror means (3) and the active region (1).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kapon et al (EP 1028505).

Regarding claims 3-5,

Figures 3A-3E illustrate different geometric structure of the grid layer (4) [applicant's boundary region] for providing mode suppression.

Therefore, the different forms of applicant's boundary region as in claims 3-5 would have been an obvious design preference, as suggested and implied by Kapon et al, since none of the particular forms modify the operation of the VCSEL i.e. the operation remains the same. See *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1996).

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kapon et al (EP 1028505) in view of Ostergaard et al (PN 6,683,898).

Regarding claim 9,

Kapon et al is silent as to the polarization of the modes.

Figure 1A illustrates a VCSEL having a bottom mirror (102), an active layer (104) and a top mirror (105), as described in column 8 lines 30-64 region (115) provides mode suppression. Column 4 lines 61 to column 5 line 2, discloses polarization of the modes.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to combine the teachings of Ostergaard et al with the laser device of Kapon et al because it would improve laser efficiency, column 3 lines 1-13,50-65 of Ostergaard et al.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kapon et al (EP 1028505) in view of Shieh et al (PN 5,293,392).

Regarding claim 10,

Kapon et al is silent as to the etching preventing layer.

However, the use of etch stop layer in VCSEL is well known in the art, as disclosed by Shieh et al in column 2 and in the abstract, where an etch stop layer (20) is positioned on the top mirror.

***Allowable Subject Matter***

Claims 13-15 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

None of the cited prior arts alone or in combination discloses the claimed limitations of dependent claim 13 having in particular emitting spots with the same phase.

Claims 16-23 are allowed.

Regarding claims 16-23,

None of recited prior arts discloses the claimed laser having the limitations of independent claim 16 with an active layer between a first and second reflection layer, where a light emitting region is formed on the first reflection layer, where the light emitting region includes a plurality of divided regions for producing light emitting spots corresponding to a specific oscillation mode and in particular the media of the surface layer of the light emitting surfaces having different refractive indices so that the light emitting spots have the same phase.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ARMANDO RODRIGUEZ whose telephone number is 571-272-1952. The examiner can normally be reached on 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MINSUN HARVEY can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
ARMANDO RODRIGUEZ  
Examiner  
Art Unit 2828

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